



Published in final edited form as:

*J Pediatr Hematol Oncol*. 2014 March ; 36(2): 118–124. doi:10.1097/MPH.0000000000000061.

## Primary Care Physician Perceptions of Adult Survivors of Childhood Cancer

Jody L. Sima<sup>1</sup>, Susan M. Perkins<sup>2</sup>, and David A. Haggstrom<sup>3,4,5</sup>

<sup>1</sup>Department of Pediatrics, SUNY Upstate Medical University, Syracuse, NY

<sup>2</sup>Indiana University School of Medicine, Indianapolis, IN

<sup>3</sup>VA Health Services Research & Development Center on Implementing Evidence-based Practice, Roudebush VAMC, Indianapolis, IN

<sup>4</sup>Division of General Internal Medicine and Geriatrics, Department of Medicine, Indiana University School of Medicine, Indianapolis, IN

<sup>5</sup>IU Center for Health Services and Outcomes Research, Regenstrief Institute, Inc., Indianapolis, IN, USA

### Abstract

Increasing cure rates for childhood cancers have resulted in a population of adult childhood cancer survivors (CCS) that are at risk for late effects of cancer-directed therapy. Our objective was to identify facilitators and barriers to primary care physicians (PCPs) providing late effects screening and evaluate information tools PCPs perceive as useful. We analyzed surveys from 351 practicing internal medicine and family practice physicians nationwide.

A minority of PCPs perceived that their medical training was adequate to recognize late effects of chemotherapy (27.6%), cancer surgery (36.6%), and radiation therapy (38.1%). Most PCPs (93%) had never used Children's Oncology Group guidelines, but 86% would follow their recommendations. Most (84–86%) PCPs stated that they had never received a cancer treatment summary or survivorship care plan but (>90%) thought these documents would be useful. PCPs have a low level of awareness and receive inadequate training to recognize late effects.

Overall, PCPs infrequently utilize guidelines, cancer treatment summaries, and survivorship care plans, although they perceive such tools as useful. We have identified gaps to address when providing care for CCS in routine general medical practice.

### Keywords

cancer survivor; survivor; primary health care; survey

For correspondence & reprints: Jody Sima, Center for Children's Cancer and Blood Disorders, Upstate Medical University Hospital, 750 E Adams St, Syracuse, NY, 13210-2306, Tel 315-464-5294, Fax 315-464-7238, simaj@upstate.edu.

Conflict of Interest

The authors have no conflict of interest to report.

## Introduction

Dramatic increases in cure rates for childhood cancer patients over the past 30 years have resulted in a growing population of adults who are childhood cancer survivors (CCS)[1]. These adults bear the unintended burden of successful cancer therapy, that is, morbidity and mortality that may not arise until years after the initial cancer treatment is complete. Approximately 250,000 adult CCS in the United States are at risk for late effects of their cancer therapy [2]. Chronic medical conditions are reported by 62.3% of the adult CCS population [2]. General medical care for this population must address the late effects of childhood cancer.

To guide health care delivery for adult CCS, the Children's Oncology Group (COG) created the Long-Term Follow-Up Guidelines for Survivors of Childhood, Adolescent, and Young Adult Cancers [3]. Little is known about awareness and implementation of these guidelines. In a 2007 study of adult CCS, 41% of female patients that guidelines identified as high risk for breast cancer reported having a recommended mammogram in the past two years [4]. This same study found that only 28% of patients at high risk for cardiac dysfunction reported receiving a recommended echocardiogram. These proportions fall to 33% reporting a mammogram, and 21% reporting an echocardiogram, if the CCS were followed solely in a primary care setting [4]. Taken together, these findings suggest low guideline adherence among those adult CCS at high risk for late effects.

Opportunities exist for improved guideline adherence. Eighty-seven percent of a cohort of 14,370 CCS reported general contact with the health care system over a two-year period [5]. Of all cancer-related visits made to physicians' offices in 2001–2, about one-third were made to primary care physicians (PCPs) [6]. Clearly, PCPs will play an important role in promoting evidence-based follow-up care for adult CCS.

The practice patterns of PCPs providing care for CCS is largely unknown. The Institute of Medicine [6] and Livestrong Foundation [7] have suggested that cancer survivors be provided documents with recommendations for follow-up care and health promotion. The treating oncology team is encouraged to summarize the cancer therapy a patient has received (cancer treatment summary) and outline plans for late effect surveillance (cancer survivorship care plan) so that this information can be shared with both the patient and other physicians.

The aim of our study was to identify facilitators and barriers to PCPs providing optimal care for CCS. Through a PCP survey, we set out to examine what information tools PCP's perceive as useful, including practice guidelines, cancer treatment summaries, and survivorship care plans, as well as what physician characteristics are associated with the perceptions and use of these information tools.

## Materials and Methods

### Sample

We surveyed 1,500 individuals randomly sampled from a nationwide pool of general internal medicine and family practice physicians in the American Medical Association (AMA) Physician Masterfile. The AMA Masterfile includes physicians regardless of AMA membership and is considered representative of the U.S. physician population. Stratified sampling based upon four regions (as defined by the U.S. Census Bureau) was conducted to ensure equal representation in case of regional variation.

### Survey Development

Survey items were based upon a model for implementing change in the health care setting [8]. This model utilizes behavioral theories on implementing change to assess stages-of-change in clinical practice [9]. The survey items addressed *stages of change* in practice under the categories of orientation, insight, and acceptance. Orientation addresses physician awareness and interest in the medical problems of adult CCS. Insight focuses upon physician understanding of current medical knowledge, practice routines, and barriers to care. Acceptance comprises physician acceptance and attitude towards practice change.

To develop the survey, we engaged experts from multiple clinical disciplines (PCPs, pediatric hematology/oncology physicians, nurse practitioners, registered nurses), as well as behavioral scientists. The survey was refined using the Tailored Design Method [10] and item-by-item review to gain feedback on item content, readability, ordering, and general understandability.

### Survey Administration

The survey was mailed to participants with a cover letter, prepaid return envelope, and \$1 incentive. Subjects that refused to participate were instructed to return blank surveys. Non-responders were sent two additional mailings, one month apart, from February 1 to April 5, 2008. Surveys were received for 4 months following the initial mailing. Human subjects approval was provided by the Indiana University-Purdue University IRB.

### Measures

*Practice and physician characteristics:* From the AMA Masterfile, physician characteristics included gender, specialty (family practice or internal medicine), training status (in-training or complete), and date of medical school completion; practice characteristics included census region. From the survey, practice characteristics included practice type and number of outpatient visits per week. *Stage of change:* physicians completed Likert scale survey items addressing the three stages of change: orientation, insight, and acceptance. Useful information sources and formats were also ranked by physicians. The survey is available as supplemental digital content.

### Data Analysis

Responders were defined as primary care physicians who completed at least one of the items analyzed in the survey. Responders were compared to non-responders on sociodemographic

and practice characteristics using chi-squared tests or t-tests. The distribution of responses by stage of change was assessed. Useful information sources and formats were summarized according to what percentage of physicians ranked each item as the most useful.

Frequencies were generated for physician demographics and other survey measures. In order to compare training adequacy across different knowledge domains (chemotherapy, radiation therapy, and surgery), paired t-tests compared scales representing the sum of the Likert scores (1–5) for the questions of interest (Insight section). For the purpose of multivariable models, binary variables were created for (1) the availability of treatment summaries and survivorship care plans (occasionally or more often vs. never), and (2) the usefulness of treatment summaries and survivorship care plans (not strongly agree vs. strongly agree). The following explanatory physician characteristics were considered in regression models: gender, specialty, years since medical school graduation, number of outpatients seen in a typical week, and census region. Previous literature has shown these explanatory characteristics to be associated with physician behavior. Specifically, cancer screening has been associated with outpatient volume [11], physician age [12], gender [13], specialty [14], and local practice norms [15]. The behavioral model of access to medical care [16] also suggests that health care delivery is influenced by provider-related characteristics. Post-hoc analyses restricted the models to those PCPs who indicated that they had participated in the care of a cancer survivor; however, the results were not substantively different.

All analyses accounted for the stratified sampling design to allow for correct point estimates and standard errors. For the comparison of responders to non-responders, the weights were the inverse of the probability of being selected for survey mailing within each region. For the analyses of responders, these weights were adjusted to reflect the probabilities of responding within each region. All analyses were performed using SAS version 9.1.3 (SAS Institute, Inc., Cary, NC, USA).

## Results

### Response Characteristics

Surveys were returned by 351 U.S. physicians with complete or partial data for analysis (Figure 1). The overall physician response rate was 23%. Response rates were higher for physicians in family practice than general internal medicine (30.2% vs. 16.5%,  $p < .0001$ ). There were no other significant differences in physician and practice characteristics between responders and non-responders. Sample characteristics for respondents are shown in Table I.

### Survey responses by Stage of Change

Responses were grouped according to the stages of change model (Table II).

#### **A. Orientation: Awareness and interest in the medical problems of adult CCS**

—About 40% of PCPs stated that they had never participated in the medical care of a CCS, and about 37% were neutral or disagreed with the statement that the problems of CCS were important to their practice.

**B. Insight: Understanding current medical knowledge**—About 40% of PCPs were aware of practice guidelines for CCS. A minority of PCPs perceived that their medical training was adequate to recognize late effects of chemotherapy (27.5%), cancer surgery (36.5%), and radiation therapy (38.1%). PCPs rated their training adequacy approximately the same for surgery and radiation (mean = 2.82 and 2.84, respectively,  $p=.6210$ ), and they rated their training adequacy for both surgery and radiation higher than chemotherapy (mean 2.55,  $p < .0001$  for both).

**C. Insight: Understanding barriers and current practice routines**—Having adequate time in the patient visit to discuss late effects was a barrier for 42% of PCPs. Almost 33% of PCPs agreed that cancer survivors did not perceive late effects as a risk to their health and 39% agreed that adult CCS had problems with insurance coverage of the recommended screening for late effects.

Majorities of PCPs agreed that it was difficult to get a cancer history from a patient (65.0%) and from the treating oncologist (51.4%). Most PCPs stated that they had never received a cancer treatment summary or survivorship care plan (84% and 86%, respectively), and 93% of PCPs had never used the COG late effects guidelines. Only years since graduated from medical school was significantly associated with the availability of a care plan (Table III, OR = 1.04,  $p = 0.03$ )

**D. Acceptance: Acceptance and attitude towards change**—Although the reported receipt of cancer treatment summaries or survivorship care plans were low, greater than 90% of PCPs thought it would be useful to receive these continuity of care documents. Similarly, 86% of PCPs agreed that they would follow the COG late effects guidelines.

In multivariable models (Table III), females were more likely to strongly agree that a treatment summary was useful (OR=0.53). In the U.S., PCPs practicing in the Midwest were more likely than PCPs in the South to agree that a treatment summary was useful (OR=3.59). None of the provider variables were associated with report of a treatment summary being available. PCPs with more years post-graduation since medical school were less likely to agree that a care plan was useful (OR=1.04). Females were more likely to agree that a care plan was useful (OR=0.43). There was also regional variation in the perceived usefulness of care plans. Those with more years post-graduation since medical school were more likely to report that a care plan was available (OR = 1.04).

### Information sources or format

Sources of information on adult CCS were ranked by PCPs. The oncologist was reported as most important, with 44.6% of number one rankings, followed by the Internet (33.2%), textbooks (9.7%), journal articles (7.1%), primary care colleagues (3%), and other specialty physicians (2.5%). When asked to identify the most useful format for a medical screening prompt, PCPs most often ranked a letter in the mail (41.2%) as the most useful prompt, followed by a computer prompt or flow sheet in the chart (35.1%), a telephone call to the office (10.6%), email reminder (6.7%), website with patient information (5.7%), and telephone hotline (0.7%).

## Discussion

Recent estimates show that 1/640 people between the ages of 20–39 years in the U.S. have a history of cancer [6]. Given the increasing number of adult CCS, and the fact that about 50% of our sample reported seeing between 76–125 patients per week, it is unlikely that 40% of PCPs “never” participate in the medical care adult CCS as was self-reported. These findings may be better explained by a lack of PCP awareness about the presence of CCS in their practice. This lack of awareness may represent a communication problem among physicians and patients, and thus, may potentially be reduced with cancer treatment summaries and survivorship care plans. Provider education regarding the issues of adult CCS is a goal of several national organizations [6,7,17], and future interventions should take into account the broad lack of awareness about the high prevalence of adult CCS in the general population. PCPs by no means discounted the needs of CCS, as the majority agreed that the problems of childhood cancer survivors were important to their medical practice.

An alternative explanation for the finding that few PCPs reporting being exposed to a survivor of childhood cancer is that such patients may have limited access to health care. Adult CCS are less likely to have health insurance coverage [18] and uninsured survivors utilize health care (both cancer-specific and general health care resources) less than those with insurance [19]. Survivors of adolescent and young adult cancer report more cost barriers to health care access and less utilization than the general population, regardless of whether they had insurance or not [20]. Therefore, CCS may simply be in the primary care office less often.

### Medical training

A previous review of residency training curriculums for both internal medicine and family practice revealed a lack of information about cancer survivorship [21]. The majority of PCPs in our sample perceived the adequacy of their training to recognize late effects of cancer therapy to be poor. Our findings suggest PCPs are more comfortable recognizing late effects from surgery and radiation than chemotherapy, perhaps because the risks of surgical procedures are similar when performed for cancer and non-cancer purposes. For the purpose of clinical follow-up, the risk stratification of CCS has been proposed, including the classification of patients who receive only surgical therapy into a low-risk group of CCS [22]. Nonetheless, our data suggest that PCPs will need further training to effectively participate in the follow-up care of all risk groups.

### Practice guidelines, cancer treatment summaries and survivorship care plans

The COG guidelines are the most complete source of information about the late effects of childhood cancer available. However, the majority (60.4%) of PCPs did not know that COG guidelines existed, and only 7.4% of PCPs reported using COG guidelines frequently or very frequently. To increase availability, the COG guidelines were posted on the National Guideline Clearinghouse (Agency for Healthcare Research and Quality). Multiple, additional channels of dissemination will clearly be necessary to promote broader knowledge and use of COG guidelines among PCPs..

There is strong support from national organizations and policymakers for the use of cancer treatment summaries and survivorship care plans [6,7]. However, little is known about how these tools have been implemented among PCPs caring for *childhood* cancer survivors, their level of acceptance among PCPs, and what physician factors may be associated with their implementation. Canadian PCPs reported that a survivorship care plan would be the most useful tool to help them provide follow-up medical care for adult-onset cancer survivors [23]. Among U.S. PCPs seeing adult CCS, we found the use of cancer treatment summaries and survivorship care plans was low (<20%), yet the perceived usefulness was very high (>90%). While low levels of implementation were present in 2008, use of these tools may be somewhat higher now due to the significant amount of attention they have received. When implemented, it appears that PCPs naïve to these tools will be receptive to their use at the outset. Future interventions should explore tailoring messages about cancer treatment summaries and survivorship care plans to male and older physicians who are less likely to perceive them as useful.

### Information sources

The oncologist was identified as the PCPs' most important source of information about late effects of childhood cancer, although about half of PCPs agreed that it was difficult to get the cancer history from the treating oncologist. The second most important source of information was the Internet. Our results complement previous findings that patients first obtain information from the Internet but prefer information from their physicians[24]. The Passport for Care is an internet based resource that is beginning to be used by oncologists and patients and may be a resource of growing importance. The sources and accessibility of information by PCPs and patients need further attention to ensure optimal delivery of accurate, timely information about adult CCS.

Given that 42% of PCPs agreed that adequate time was a barrier to discussing late effects, efficient methods of communication will continue to need to be development among PCPs, oncologists and cancer survivors. Health care information systems, such as patient and physician reminders or Web-based patient portals, may help to coordinate the efforts of physicians caring for adult CCS.

The results of this study should be interpreted in the context of its limitations, including the low response rate. Of note, physician mail surveys typically have low response rates (29–43%), with a trend towards decreasing responsiveness [25]; thus, our response rate (24%) is consistent within these patterns. Furthermore, there is no single acceptable survey response rate [26], and a low response rate does not alone affect the validity of the data collected [27] “as long as the nonresponse effects are documented, tested, and understood.” [28]

We found that our responders and non-responders were similar with the exception of specialty type. It is possible that the language used in the survey influenced the response rate and introduced the response bias seen between specialty types. A number of surveys were returned unanswered from PCPs with comments to the effect that they do not see children in their practice. The focus of the survey on “an adult survivor of childhood cancer” was described in the cover letter; however, use of the phrase “childhood” cancer survivor may have influenced the differential response rate by suggesting a pediatric population. The



increased proportion of respondents who were family practice physicians, compared to general internists, lends support to this supposition given that family practice physicians are more likely to include pediatrics within their scope of practice. Future research and educational materials targeting the needs of CCS will need to consider how best to describe this population so as to be easily recognizable by PCPs as applying to their practice.

The strengths of our study include the large national sample of physicians. Few studies to our knowledge have evaluated the needs, perceptions or attitudes of *adult* primary care providers caring for adult survivors of *childhood* cancer. Prior studies have discussed models of care for cancer survivors and the role of the primary care physician [29]. PCPs caring for adult colorectal cancer survivors report that the topic of survivor care is important, but they need more information about long term complications from cancer therapy [30]. Primary care physician perspectives on the care for breast and colorectal cancer survivors has also been reported [31, 31, 21]. But again, the current study occupies a unique niche in evaluating the adult PCP perspective on caring for adult CCS.

Furthermore, we collected data so as to inform future interventions to change medical practice and improve the care of adult CCS. We found that PCPs have a low level of awareness about the medical issues of adult CCS; receive inadequate medical training to recognize late effects of treatment; and infrequently use cancer treatment summaries, survivorship care plans, and COG guidelines. Future research should study the impact of cancer treatment summaries and survivorship care plans upon the quality of care and clinical outcomes of CCS. By understanding the perceptions of PCPs, we can better understand how to incorporate recommended follow-up care for CCS into routine general medical practice.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments

This research was supported by General Clinical Research Center M01 RR00750 (Sima, Perkins), VA HSR&D Career Development Award CD207016-2 (Haggstrom), and NIH/NCRR Grant Number RR025761 (Perkins). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the federal government. The respective funding organizations did not play a role in the following: design and conduct of the study; collection, management, analysis, and interpretation of the data; and preparation, review, or approval of the manuscript.

Special acknowledgements to Joan Haase, PhD, Aaron Carroll, MD, and Terry Vik, MD for their expertise and support of this manuscript.

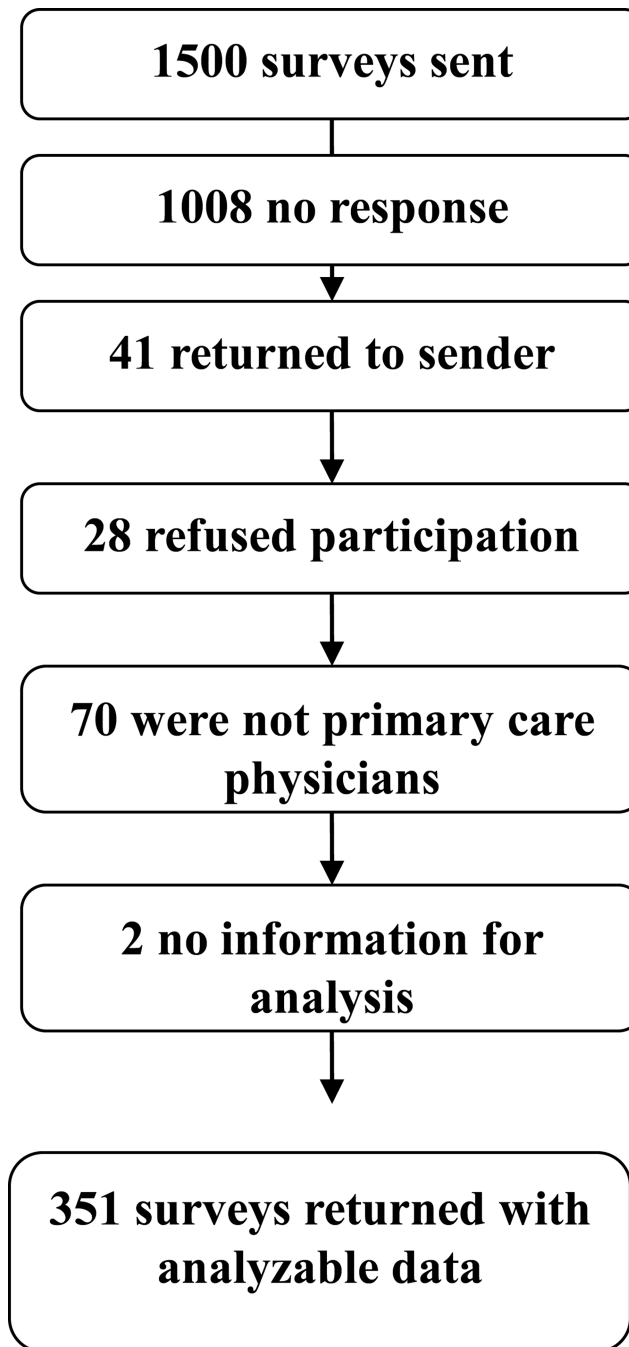
## REFERENCES CITED

1. Ries, LAG.; Eisner, MP.; Kosary, CL., et al. SEER Cancer Statistics Review, 1975–2002, National Cancer Institute. Bethesda, MD: Available at: [http://seer.cancer.gov/csr/1975\\_2002/](http://seer.cancer.gov/csr/1975_2002/). [Accessed June 6, 2007]
2. Oeffinger KC, Mertens AC, Sklar CA, et al. Chronic Health Conditions in Adult Survivors of Childhood Cancer. *N Engl J Med*. 2006; 15:1572–1582. [PubMed: 17035650]
3. Children's Oncology Group. Survivorship Guidelines. Available at: <http://www.survivorshipguidelines.org/>.



4. Nathan PC, Greenberg KK, Ness MC, et al. Medical Care in long term survivors of childhood cancer: A report from the Childhood Cancer Survivor Study. *JCO*. 2008; 26:4401–4409.
5. Oeffinger KC, Mertens AC, Hudson MM, et al. Health Care of Young adult Survivors of Childhood Cancer: A Report from the Childhood Cancer Survivor Study. *Ann Fam Med*. 2004; 2:61. [PubMed: 15053285]
6. Hewitt, M.; Weiner, S.; Simone, J., editors. *Childhood Cancer Survivorship: Improving Quality of Care and Quality of Life*. Washington, DC: National Cancer Policy Board; 2003.
7. Centers for Disease Control and Prevention. Department of Health and Human Services. *Livestrong Foundation*. , editor. 2004. *A National Action Plan for Cancer Survivorship: Advancing Public Health Strategies*.
8. Grol, R.; Wensing, M.; Eccles, M. *Improving Patient Care; the Implementation of Change in Clinical Practice*. Oxford: Elsevier; 2005. *Characteristics of Successful Innovations*; p. 41-70.
9. Grol R, Bosch M, Hulscher M, et al. Planning and Studying Improvement in Patient Care: The Use of Theoretical Perspectives. *Milbank Q*. 2007; 85:93–198. [PubMed: 17319808]
10. Dillman, DA. *Mail and Internet Surveys: The Tailored Design Method*, Second edition. Danvers, MA: John Wiley & Sons; 2000. p. 32-200.
11. Gutow AP, Erlebacher JA, Hubbard SG, et al. Surgeon Volume and Operative Mortality. *NEJM*. 2004; 350:1256–1258. [PubMed: 15028832]
12. Musham C, Holdsworth J. The effect of physician age, gender, practice type, and region on patient health risk education. *AHSR FHSR Annu Meet Abstr Book*. 1996; 13:133.
13. Lurie N, Margolis KL, McGovern PG, et al. Why do patients of female physicians have higher rates of breast and cervical cancer screening? *J Gen Intern Med*. 1997 Jan; 12(1):34–43. [PubMed: 9034944]
14. Haggstrom DA, Phillips KA, Liang SY, et al. Variation in screening mammography and Papanicolaou smear by primary care physician specialty and gatekeeper plan. *Cancer Causes Control*. 2004 Nov; 15(9):883–892. [PubMed: 15577290]
15. Haas JS, Fitzmaurice G, Brawarsky P, et al. Association of regional variation in primary care physicians' colorectal cancer screening recommendations with individual use of colorectal cancer screening. *Prev Chronic Dis*. 2007 Oct.4(4):A90. [PubMed: 17875265]
16. Phillips KA, Morrison KR, Andersen R, et al. Understanding the context of healthcare utilization: assessing environmental and provider-related variables in the behavioral model of utilization. *Health Serv Res*. 1998 Aug; 33(3 Pt 1):571–596. [PubMed: 9685123]
17. Hewitt, M.; Greenfield, S.; Stoval, E., editors. *Committee on Cancer Survivorship: Improving Care and Quality of Life*. Institute of Medicine and National Research Council; 2005. *From Cancer Patient to Cancer Survivor: Lost in Transition*.
18. Park ER, Li FP, Emmons KM, et al. Health Insurance Coverage in Survivors of Childhood Cancer: The Childhood Cancer Survivor Study. *JCO*. 2005; 23:9187.
19. Casillas J, Castellino SM, Hudson MM, et al. Impact of insurance type on survivor-focused and general preventative health care utilization in adult survivors of childhood cancer: the Childhood Cancer Survivor Study (CCSS). *Cancer*. May 1; 117(9):1966–1975. [PubMed: 21509774]
20. Kirchhoff AC, Lyles CR, Fluchel M, et al. Limitations in health care access and utilization among long-term survivors of adolescent and young adult cancer. *Cancer*. 2012 Dec 1; 118(23):5964–5972. [PubMed: 23007632]
21. Ferrell B, Winn R. Medical and Nursing Education and Training Opportunities to Improve Survivorship Care. *JCO*. 2006; 24:5142–5148.
22. Von der Weid N, Wagner HP. Organization of follow-up in paediatric oncology. *Eur J Cancer*. 2003; 39:1150–1154. [PubMed: 12736116]
23. Del Giudice M, Verma S, Piliotis E, et al. *ASCO Annual Meeting Proceedings Part I*. *JCO*. 2007; 25:2007–6562.
24. Hesse BW, Arora NK, Burke Beckjord E, et al. Information support for cancer survivors. *Cancer*. 2008 Jun 1; 112(11 Suppl):2529–2540. [PubMed: 18428201]
25. Crane L, Daley MF, Barrow J, et al. Sentinel Physician Networks as a Technique for Rapid Immunization Policy Surveys. *Eval Health Prof*. 2008; 31(1):43. [PubMed: 18184632]

26. Charlton R. Research: is an 'ideal' questionnaire possible? *Int J Clin Pract*. 2000 Jul-Aug;54(6): 356–359. [PubMed: 11092107]
27. Templeton L, Deehan A, Taylor C, et al. Surveying general practitioners: does a low response rate matter? *Br J Gen Pract*. 1997 Feb; 47(415):91–94. [PubMed: 9101692]
28. Grava-Gubins I, Scott S. Effects of various methodologic strategies: survey response rates among Canadian physicians and physicians-in-training. *Can Fam Physician*. 2008 Oct; 54(10):1424–1430. [PubMed: 18854472]
29. Singer S, Gianinazzi ME, Hohn A, et al. General practitioner involvement in follow-up of childhood cancer survivors: A systematic review. *Pediatr Blood Cancer*. 2013 Oct; 60(10):1565–1573. [PubMed: 23813795]
30. Salz T, Oeffinger KC, Lewis PR, et al. Primary care providers' needs and preferences for information about colorectal cancer survivorship care. *J Am Board Fam Med*. 2012 Sep-Oct;25(5): 635–651. [PubMed: 22956699]
31. Klabunde CN, Han PK, Earle CC, et al. Physician roles in the cancer-related follow-up care of cancer survivors. *Fam Med*. 2013 Jul-Aug;45(7):463–474. [PubMed: 23846965]
32. Cheung WY, Aziz N, Noone AM, et al. Physician preferences and attitudes regarding different models of cancer survivorship care: a comparison of primary care providers and oncologists. *J Cancer Surviv*. 2013 Sep; 7(3):343–354. Epub 2013 Mar 24. [PubMed: 23526165]
33. Potosky AL, Han PK, Rowland J, et al. Differences between primary care physicians' and oncologists' knowledge, attitudes and practices regarding the care of cancer survivors. *J Gen Intern Med*. 2011 Dec; 26(12):1403–1410. [PubMed: 21785923]



**Figure 1.**  
Account of Survey Responses

**Table I**

## Characteristics of Physician Survey Respondents (n=351)

Characteristic	Primary Care Physician Respondents (standard error)
Gender	
Male	60.1 % (2.7%)
Female	39.9% (2.7%)
Training status	
In-training	6.0% (1.3%)
Complete	94.0% (1.3%)
Specialty	
Family Practice	64.2% (2.6%)
Internal Medicine	35.8% (2.6%)
Medical school graduation date	
Prior to 1970	5.3% (1.3%)
1970–1980	14.0% (1.9%)
1980–1990	24.1% (2.3%)
1990–2000	38.7% (2.7%)
2000–2007	17.8% (2.1%)
Main practice Setting <sup>*</sup>	
Office-Based	76.7% (2.3%)
Hospital	5.3% (1.2%)
Multispecialty Practice	3.8% (1.0%)
Managed Care	2.5% (0.9%)
Academic	7.8% (1.4%)
Government	3.9% (1.1%)
Weekly outpatient visits <sup>†</sup>	
25 or fewer	8.7% (1.5%)
26–50	11.3% (1.7%)
51–75	18.6% (2.2%)
76–100	30.6% (2.6%)
101–125	20.3% (2.3%)
126 or more	10.6% (1.7%)

<sup>\*</sup>  
n=336

<sup>†</sup>  
n=337

**Table II**

Primary care physician response categorized by stage of change (overall n=351, weighted percent and standard error)

A. Orientation: Awareness and interest in the problem					
How often do you participate in the medical care of a childhood cancer survivor?	Never	Occasionally	Frequently	Very Frequently	
	40.2% (2.7%)	58.7% (2.7%)	0.9% (0.5%)	0.2% (0.2%)	
Addressing the health care problems of childhood cancer survivors is important to my current practice.	Strongly Disagree 3.2% (1.0%)	Somewhat Disagree 6.9% (1.4%)	Neutral 27.0% (2.5%)	Somewhat Agree 40.9% (2.7%)	Strongly Agree 22.0% (2.3%)
B. Insight: Understanding current medical knowledge					
Prior to this survey, were you aware that clinical practice guidelines existed for the medical care of childhood cancer survivors?	Yes	No			
	39.6% (2.7%)	60.4% (2.7%)			
How often have you used the National Guideline Clearinghouse to locate any type of clinical practice guidelines?	Never 65.9% (2.6%)	Occasionally 26.8% (2.4%)	Frequently 6.9% (1.4%)	Very Frequently 0.5% (0.4%)	
I have had adequate training to recognize late effects of...	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
...chemotherapy including sterility, endocrine deficiencies, cardiomyopathy, osteoporosis, and others.	21.0% (2.3%)	36.0% (2.7%)	15.4% (2.0%)	22.4% (2.4%)	5.1% (1.3%)
...cancer surgeries (amputation, splenectomy etc...	14.7% (2.0%)	30.6% (2.5%)	18.2% (2.2)	30.9% (2.6%)	5.6% (1.3%)
...radiation therapy (skin malignancies, local dysfunction).	13.7% (1.9%)	30.6% (2.6%)	17.6% (2.2%)	33.7% (2.7%)	4.4% (1.2%)
C. Insight: Understanding barriers and current practice routines					
How often have you had a cancer treatment summary available to you when providing care to a childhood cancer survivor?	Never 84.2% (2.0%)	Occasionally 12.8% (1.9%)	Frequently 2.3% (0.8%)	Very Frequently 0.7% (0.5%)	
How often have you had a cancer survivor care plan available to you when providing care to a childhood cancer survivor?	86.2% (1.9%)	11.6% (1.8%)	1.7% (0.7%)	0.4% (0.4%)	

How often have you used the clinical practice guidelines created by the Children's Oncology Group to guide medical care for a childhood cancer survivor?	Strongly Disagree 93.3% (1.4%)	Somewhat Disagree 6.0% (1.3%)	Neutral 0.4% (0.4%)	Somewhat Agree 0.2% (0.2%)	Strongly Agree 0.2% (0.2%)
It is difficult to obtain essential elements of a cancer history from the patient.	3.9% (1.0%)	12.1% (1.8%)	19.0% (2.2%)	48.0% (2.8%)	17.0% (2.1%)
It is difficult to obtain elements of the cancer history that the patient can't provide, i.e. from the treating oncologist.	4.3% (1.1%)	18.6% (2.2%)	25.8% (2.5%)	40.6% (2.8%)	10.8% (1.8%)
In my practice, I find there is not enough time to discuss late effects of cancer therapy.	9.8% (1.7%)	19.5% (2.2%)	28.7% (2.6%)	30.4% (2.6%)	11.6% (1.8%)
Survivors of childhood cancer do not perceive late effects as a serious health threat.	8.9% (1.6%)	18.3% (2.2%)	40.4% (2.8%)	29.1% (2.6%)	3.3% (1.0%)
Cancer survivors often cannot afford or lack insurance coverage for recommended screening for late effects.	3.2% (1.0%)	14.2% (1.9%)	43.4% (2.8%)	26.5% (2.5%)	12.6% (1.9%)
D. Acceptance: Positive attitude towards potential intervention, accepting the change					
In my practice, I would follow recommendations based upon the Children's Oncology Group childhood cancer survivor guidelines.	1.2% (0.6%)	0.4% (0.4%)	12.0% (1.9%)	34.5% (2.7%)	52.0% (2.8%)
It would be useful to receive timely reminders to direct late effects screening of cancer survivors.	1.2% (0.6%)	0.9% (0.5%)	6.9% (1.5%)	26.3% (2.5%)	64.7% (2.7%)
It would be useful to have a <i>cancer treatment summary</i> to manage childhood cancer survivors if provided to me by the treating oncology team.	2.7% (0.9%)	1.0% (0.6%)	6.0% (1.4%)	21.0% (2.3%)	69.4% (2.6%)
It would be useful to have a <i>cancer survivor care plan</i> to manage childhood cancer survivors if provided to me by the treating oncology team.	2.0% (0.8%)	0 (-)	5.7% (1.3%)	18.9% (2.2%)	73.5% (2.5%)

**Table III**

Multiple logistic regression models for binary outcomes

	Treatment Summary Useful to Manage Patient*	Treatment Summary is Available**	Care Plan Useful to Manage Patient*	Care Plan is Available**
Effect	OR Estimate 95% CI	OR Estimate 95% CI	OR Estimate 95% CI	OR Estimate (95% CI)
Years since graduated Medical School	1.02 (0.997, 1.05)	1.02 (0.99, 1.05)	<b>1.04 (1.01, 1.06)<sup>††</sup></b>	<b>1.04 (1.003, 1.07)<sup>†</sup></b>
Number of Outpatients (ref. 126)				
25	0.56 (0.15, 2.12)	0.63 (0.15, 2.64)	0.60 (0.16, 2.17)	0.19 (0.03, 1.11)
26–50	0.86 (0.28, 2.70)	0.48 (0.13, 1.84)	0.37 (0.10, 1.37)	0.63 (0.17, 2.40)
51–75	0.94 (0.34, 2.62)	0.42 (0.13, 1.35)	0.70 (0.23, 2.13)	0.27 (0.08, 0.96)
76–100	1.02 (0.41, 2.52)	0.47 (0.17, 1.27)	0.82 (0.31, 2.15)	0.42 (0.15, 1.18)
101–125	1.13 (0.44, 2.92)	0.52 (0.18, 1.50)	1.03 (0.38, 2.75)	0.38 (0.12, 1.16)
Female (ref. Male)	<b>0.53 (0.30, 0.95)<sup>†</sup></b>	0.91 (0.44, 1.88)	<b>0.43 (0.23, 0.81)<sup>††</sup></b>	0.69 (0.29, 1.61)
Family Practice (ref. Internal Medicine)	1.13 (0.65, 1.99)	2.08(0.95, 4.54)	1.02 (0.56, 1.86)	1.23 (0.55, 2.78)
Census Region (ref. Midwest)				
West	1.86 (0.85, 4.10)	0.47(0.18, 1.21)	<b>2.42 (1.05, 5.61)<sup>†</sup></b>	0.67 (0.25, 1.84)
Northeast	1.92 (0.89, 4.19)	1.00 (0.45, 2.21)	1.96 (0.83, 4.66) <sup>‡</sup>	0.98 (0.40, 2.37)
South	<b>3.59 (1.74, 7.44)<sup>††</sup></b>	0.70 (0.30, 1.62)	<b>4.48 (2.02, 9.91)<sup>††</sup></b>	0.83 (0.34, 2.07)

\* Not Strongly Agree vs Strongly Agree

\*\* Occasionally or More Often vs Never

<sup>†</sup> 0.01 < p < 0.05<sup>††</sup> p < 0.01<sup>‡</sup> Northeast different from South: OR=0.44 (95% CI: 0.21, 0.94), 0.01 < p < .05